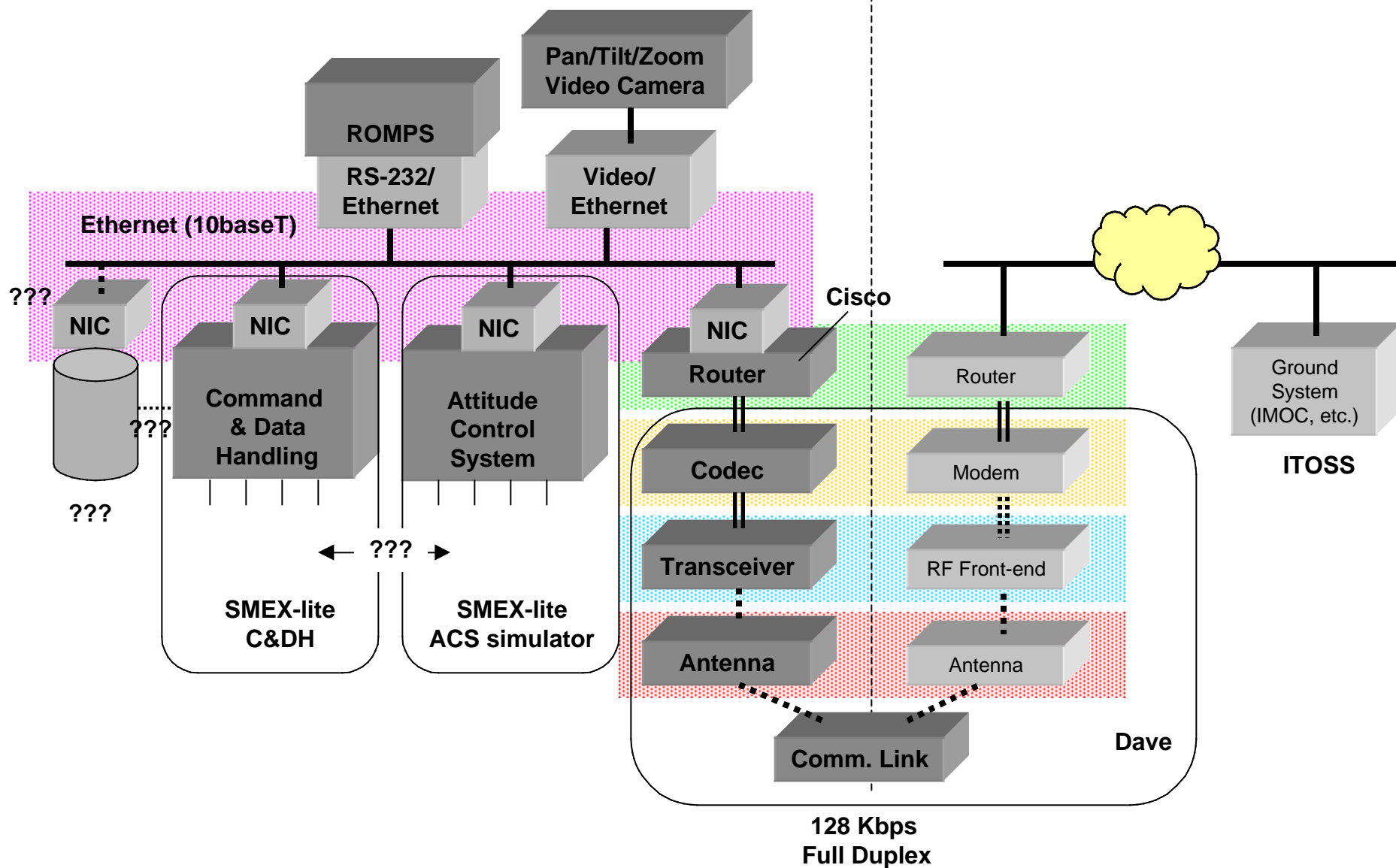


# Simplified Flat-Sat Architecture

## Satellite Components

## Ground Components



# Flat-sat Demo Minimum Requirements

- Commandable Imaging system
  - Independently commandable by PI (not through C&DH)
  - Data delivery in real-time
  - Data Record/Playback (file mgmt.)
- Desired “real” science instrument
  - Real-time data (engineering/status or science)down
  - Command - both from C&DH and direct from ground
  - Playback of stored data ( file mgmt. & transfer UDP,TCP/FTP)
- Real-time engineering data
  - Real-time engineering data down
  - Record onboard
  - Playback of stored data ( file mgmt. & transfer UDP,TCP/FTP)
- Commanding
  - Uplink ACS commands (both UDP,TCP/FTP)
  - Verify command loads
  - Memory dump/load
- Comm Link
  - 128 kbps Full Duplex
  - Asymmetric link too (2Kbps /128 Kbps)

# Flat-Sat Component Descriptions

The following areas were identified as the primary components for the initial Flat-Sat demonstration in Nov. 1999.

Standard interfaces will be documented so that work can proceed independently within each area as long as the standard interfaces are used. This allows changing components such as the LAN or communication system without any impact on other components.

1. Communication Link - Whatever is between the antennas
  - may be nothing in the case of USN, GN, or DSN
  - may be a communication satellite as in TDRSS, ACTS, InmarSat, etc.
2. Antennas - need to identify choices for satellite antennas, ground antenna probably already at site
3. Transceiver - need to identify satellite transceivers, ground transceiver probably already in place
4. Codec/Modem - Satellite may use codec for only digital functions and transceiver for digital/analog (RF) functions. On the ground the dividing line may shift to an RF Front-end that does up/down conversion (RF/IF) and a COTS satellite modem that does analog (IF) to digital conversion.
5. Routers - Processor with LAN and serial interfaces to pass traffic between communication subsystem and onboard LANs. Also supports functions such as network packet framing, traffic prioritization, security firewall, mobile IP.
6. Satellite LAN - Candidates such as Ethernet (10,100,1000), 1355, 1394, FDDI, ATM
7. Satellite Software Architecture - Issues related to using IP sockets as the basic programming interface for all communication functions
8. Satellite subsystems - Instrument, mass storage systems, any components available
9. Potential launch vehicle - category for documenting any vehicles identified for actually flying the flat-sat
10. Ground data processing system - category for documenting ground system software packages